Computer Vision

James L. Crowley

M2R MoSIG
GVR and UIS

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Lesson 2

Exercises

Projective Camera Models

1). Assume a camera at position (0, 0, 2) and orientation (-π/2, 0, 0) with focal length F, equipped with a 512 x 512 pixel retina in which pixels are size 0.02 (mm/col) et 0.01 (mm/row) and an optical axis that intersects the retina at pixel (256, 256).

a) Write the formula for the camera projective matrix $\mathbf{M}_s^i$.

b) A synchronization error causes each row to be shifted to the right by α pixels. Write the resulting transformation from retina to image $\mathbf{C}_r^i$ as well as the resulting projective matrix $\mathbf{M}_s^i$.